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ABSTRACT

A number of issues relating to metaphor are discussed in this report. Offering an account of what makes metaphors "metaphorical" (a way of understanding what metaphors are), the report also discusses some of the psychological processes associated with the comprehension of metaphor (how the understanding of metaphors might come about). The report deals with a number of questions, including: What are metaphors? How do they work? Why are they important in literature? Are they important in nonliterary language? What is involved in appreciating a metaphor? What is involved in producing one? What are the constraints on the development of the comprehension and production of metaphors by children? It answers these and other questions by first proposing a theory of metaphor and then working out some of its implications. (FL)

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Technical Report No. 154

UNDERSTANDING METAPHORS

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Understanding Metaphors

There is an old joke to the effect that the difference between maternity and paternity is that whereas the former is a matter of fact, the latter is a matter of opinion.

Although in a more serious vein, it is this same dichotomy between fact and opinion (or value) that is frequently used as the basis for distinguishing between those human endeavors that we call science and those that we call art. Even though the theories proposed by scientists may be evaluated in terms of opinions about what the facts, or what the important facts are, still the scientist aspires to characterize and explain some domain of facts, and it is in terms of them that he or she expects the adequacy of proposed theories to be evaluated. The artist, on the other hand, need aspire to no such thing. The results of his or her labors is an artifact. Be it a novel, a play, or a poem, a piece of sculpture, a painting, or a photograph, a symphony, a song, or a sonata, it can legitimately be created, exist, and be appreciated, qua artifact. It need have no pretensions to faithfully represent facts, nor need it be evaluated in such terms. The artist is not constrained in the same way as the scientist is. The artist is free to explore and experiment with his or her chosen medium of expression for its own sake. Yet, neither the artist's products nor the manner in which audiences or spectators respond to them are arbitrary. Both the product and responses to it may implicate creativity, insight, and interpretation, all of which involve psychological processes that are, as yet, but poorly understood.

In this paper I shall discuss a number of issues relating to metaphor, a form of expression that I believe has important connections with creativity, insight, and interpretation. The title is intentionally ambiguous. On the one hand, I shall offer an account of what makes metaphors metaphorical--that is, a way of understanding (what) metaphors (are). On the other hand, I shall talk about some of the psychological processes associated with their comprehension--that is, I shall discuss how (the) understanding (of) metaphors might come about.

Historically, metaphor was regarded as one of the most important ingredients of literature (see for example, Fontanier, 1821/1968), and, although I shall concentrate on linguistic metaphors, metaphorical relations can also be found in the visual arts (see Gardner, in press; Goodman, 1976, p. 89). Much of what I have to say is speculative and theoretical in nature --philosophical psychology, if you will--but, from time to time I might permit these speculations to be prejudiced by the facts. I shall be concerned with a number of basic questions including: What are metaphors? How do they work? Why are they important in literature? Are they important in nonliterary language? What is involved in appreciating a metaphor? What is involved in producing one? What are the constraints on the development of the comprehension and production of metaphors by children? I shall attempt to answer these and other questions by first proposing a somewhat heretical theory of metaphor and then working out some of its implications.

Some Standard Views and Objections

I shall take as my starting point the classification of metaphors and theories of metaphors proposed by Max Black in his now classic paper, "Metaphor" (1962). According to Black, there are basically two types of views about the nature of metaphors. The first, ultimately traceable to Aristotle, is that a metaphor involves the substitution of one expression (the one used metaphorically) for another that could have been literal. So, when we say, "Richard is a lion," what we are doing is substituting the expression a lion for brave. The motivation for such a substitution can be lexical necessity, as when, as a matter of linguistic fact, there is no literal word available in the language. Or it can be stylistic preference, aimed at providing the reader with an alleged sense of pleasure in solving the "puzzle" posed by the metaphor, but basically serving merely as an ornamental embellishment to the text. Black further argues that the so-called comparison theory of metaphor which claims that a metaphor is essentially an elliptical simile is just a special case of the substitution view. The difference is that the literal equivalent that the metaphor obscures is not the predication of an attribute (e.g., being brave) of the topic of the metaphor (Richard), but the assertion of a similarity or comparison (in this case between Richard and a lion).

While acknowledging that some metaphors may indeed be substitution metaphors, or comparison metaphors, Black goes on to argue that the interesting and important ones are not. Although we might wonder how his example, Man is a wolf, is any more important or interesting than Richard is

a lion, he uses it to explain the interaction view--a view derived from Richards (1936). The idea behind the interaction view is that the principal terms in the metaphor (the topic, or tenor, "man," and the vehicle, "wolf") interact in such a way as to permit the one to be viewed, as it were, through the eyes of the other. We view man from the perspective of our general knowledge about wolves. More recently, Black (1979) has elaborated on the interaction view, attempting to explicate it in terms that are themselves less metaphorical. However, one purpose of this paper is to explore the possibility that there is a sensible version of the comparison view--a version that is both psychologically and philosophically plausible, and that at the same time captures the important features of the interaction view.

There are two kinds of objections to standard accounts of the comparison theory. The first is that the theory "borders on vacuity" (Black, 1962, p. 37). The second is that there need not always be any detectable basis of similarity between the entities involved (e.g., Searle, 1979). I think that both kinds of criticisms are only valid in the face of a very naive version of the comparison theory. Consider first the vacuity argument: According to Black, the comparison theory implies that the respects in which the two terms in a metaphor are similar are "definite and predetermined," in which case, the argument goes, metaphors, contrary to fact, would have all the precision of scientific statements. Now, few scholars, least of all Black, would wish to deny that one of the really important characteristics of metaphors is a certain "open-ended" quality

that they have. However, I think that Black mistakenly supposes that such open-endedness is monopolized by metaphorical statements. In particular, I think it may be a mistake to suppose it is not to be found in similarity statements in general. To be sure, some statements of comparison (and some metaphors) may be "cut and dried," but others are not. The precision that Black sees as being so characteristic of scientific statements (although others, e.g., Kuhn, 1979, and Pylyshyn, 1979, would even challenge that claim) does not, therefore, seem to have anything to do with the syntactic form of the statement (e.g., predicative versus comparative). It has to do with the content of the statement.

The other basis for arguing that the comparison theory is vacuous is that metaphors cannot be just elliptical comparisons because, since everything is like everything else (e.g., Davidson, 1978; Goodman, 1976), that would be to reduce them to tautologies. On the face of it, this seems to embody an absurd assumption, namely that there is a class of statements which by virtue of their syntactic form alone are necessarily true--similarity statements. Yet, despite its apparent absurdity, it is implicit in the writings of many philosophers and psychologists who speak of reducing metaphors to "literal similes" (Searle, 1979), "the literal meaning of a simile" (Davidson, 1978), or "similes [that] are literally true" (Winner, Engel, & Gardner, in press). It seems to me to be just plain wrong to argue that similes, or any other kind of similarity statements, are necessarily true just because they are similarity statements. It is empirically false and logically nonsensical. False because there are all kinds of things that

are not like all kinds of other things, and nonsensical because, first, it would entail that the denial of a similarity statement would be self-contradictory, and second, nobody would be able to use such statements to achieve their ordinary communicative goals. In presenting my own account, the mistake that this view of similarity statements embodies will be used as a (hopefully instructive) starting point.

The other kind of objection to comparison theories is that they are too restrictive in supposing that the relationship between the terms must be that of similarity. Searle (1979), for example, argues that no amount of analysis will uncover any similarity between a person and a block of ice that can explain why we can say of someone who is unresponsive that he or she is (like) a block of ice. According to this view, the problem with the comparison theory is that it is incomplete; at best, it captures only a subset of metaphors, leaving others to be dealt with by some relationship between the terms that is not based on similarity. The reply to this argument is too complicated to present here. I have tried to present one in Ortony (1979), to which the interested reader can refer.

Although these objections by no means exhaust those raised against comparison theories of metaphor, they are certainly representative. Each leads to its own solution, or class of solutions, to the question of what metaphors are and how they work. Black's solution is to argue that the similarities need not pre-exist; they are often better thought of as being "created" by the interaction of the two terms. Davidson's solution is to deny that metaphors are metaphorical--using a metaphor is indeed a way of

drawing attention to resemblances, but the sentence incorporating the metaphor has nothing more than its literal meaning in the context in which it occurs. Searle's solution is to appeal to a wider range of relations than just similarity. In proposing a version of the comparison theory, I hope to offer an account that has a place for the valuable insights that are incorporated in some of the objections to, and replacements of, the naive theory.

A Modified Comparison Theory

If a comparison theory is to be viable, it will have to be able to provide answers to some of the more telling objections that have been levelled against comparison theories in general, and, in order to do that, it will have to be built upon a solid theory of similarity. Essentially, what I shall propose is a theory of similarity that has an account of metaphor incorporated within it. So, to some extent, my theory of similarity and my theory of metaphor will have to stand or fall together. Since the theory is discussed in some detail in Ortony (1979), I shall here only sketch it, with the warning that many of the more detailed aspects will have to be finessed for clarity and brevity of exposition.

Although the theory is essentially a psychological one concerning people's judgments about, and perceptions of, similarity, I want to start off with a philosophical point that I hope will clear the way for it. It is a point to which I alluded earlier concerning the claim that similarity statements are all true. This claim seems to be the foundation of the view of metaphor that treats it as condensed simile. According to this view,

metaphors are to be "explained" (away?) by asserting that they can all be reduced to similes which are true literal statements of similarity. The problem with this account lies in the assumption that all similarity statements are literal, and that all are true. It is easy to check one's intuitions on this point by modifying similarity statements of one's choice with hedges such as "really" and "not really." Presumably most of us would be willing to say that limes are really like lemons, whereas very few of us would agree to the claim that mountain roads are really like snakes; they are only similar metaphorically. Similarly, most people would probably deny that limes are not really like lemons, but few would deny that mountain roads are not really like snakes. These differences are contrary to those predicted by the "everything is similar to everything else" dictum, which would have to claim that all the positive assertions would be acceptable and all the negative ones unacceptable, if not self-contradictory. The issue here has to do with people's perceptions of similarity; it has to do with appearance rather than with reality. Consequently, we will have to admit that the variables that can influence perceptions (e.g., knowledge, context, etc.) are important ones that have to be taken into account, even if they complicate the picture.

The simple but important conclusion that I want to draw from these observations is that when we talk about two things being (really) similar what we mean is not that they are similar in some respect or other, but that they are judged to be similar in important respects. To argue otherwise is like arguing that everything has every property expressible by a graded

adjective because things can possess properties to degrees and sometimes it just happens that the degree to which something possesses a property is zero. No normal person, however, would want to argue that since things can be orange to different degrees, that therefore everything is orange, and that all statements to the effect that something or other, be it a pin, a pork pie, or a poem, is orange are literally true. One cannot argue that because they are not orange, poems are therefore orange!

I can now present my main claims:

(1) If two things are perceived as being <u>really</u> (i.e., literally) similar, then those two things are perceived as being similar with respect to attributes considered to be important to both of them.

(2) If two things are perceived as being similar <u>metaphorically</u>, then they are not perceived as being literally similar. Rather, the attributes that they share are perceived as being more important for the second entity in the comparison than they are for the first, and/or are themselves related by metaphorical similarity.

(3) If two things are perceived as being neither literally similar nor metaphorically similar, then they are not perceived as being similar at all, and the statement expressing their similarity is not merely false, but is in some sense anomalous too.

A more complete understanding of these claims depends on our having a more specific characterization of what is meant by an attribute, what it is for two things to share an attribute, and what is meant by the importance of an attribute. In the present context the notion of an attribute includes

properties known or generally believed to be true of the things being compared, attitudes towards them, and beliefs about them--generally, a much more amorphous group of associations and connotations than would be given in a traditional semantic feature account (e.g., Katz & Fodor, 1963). Thus, the entities involved in a comparison have to be considered to be the knowledge and belief structures that constitute the internal representations (i.e., schemata; see, for example, Rumelhart & Ortony, 1977) of things, events, places, people, and so on. Then, we can say that an attribute is any component of such a structure, relational or attributive, mythical or factual, known or suspected, connotative or denotative, and so on. Given the scope of this notion of an attribute, it is obvious that not all attributes can be easily expressed in any particular language. Certainly, we could not expect every possible attribute to be represented by a single word in the language.

Now that we have characterized attributes--along the general lines, incidentally, that some philosophers have called "credence properties" (e.g., Beardsley, 1978)--we can turn to the notion of the importance, or salience, of an attribute. Clearly some attributes are perceived as being more important in the role that they play within a concept, or schema, than are others. For example, most of us would think that having wheels was a more important attribute of cars than being metallic. Many factors contribute to our feelings about how important an attribute is, and fine discriminations are often difficult to make. Nevertheless, it is possible to devise measures of salience; people are able to rate it in laboratory

experiments, so presumably their knowledge is encoded in a way that permits such discriminations to be made. In the context of the present discussion, salience should be considered to be a measure of the prominence of an attribute, so that, in general, the fewer objects that have it (or are believed to have it, etc.) the more salient it is. A major assumption that has to be made in this connection is that the importance of an attribute vis-a-vis a particular concept can vary as a function of the context and the task or judgment at hand. There is ample psychological evidence to this effect (see, for example, Anderson & Ortony, 1975; Barclay, Bransford, Franks, McCarrell, & Nitsch, 1974; Tversky, 1977).

The third notion that requires elucidation before we can proceed is that of a matching attribute. What is needed here is not identity of attributes but high similarity. Identity is just the limiting case that converts an apparently circular account into a harmless recursive one. Sometimes the similarity between attributes that match in a similarity statement is essentially literal, sometimes it is essentially metaphorical; nevertheless, similarity of attributes is the basis upon which similarity rests. Furthermore, the matching attributes only need to be perceived as such from the point of view of the person who produces the statement of similarity. When we understand a similarity statement we may sometimes do so by introducing into our schema for the first term an applicable attribute that previously was not there. On other occasions the effect of understanding a similarity statement is to produce an increase in the perceived salience of the matching attributes in the schema corresponding to

the first term in the comparison. In Ortony (1979) I refer to these two kinds of similarity statements as attribute introducing and attribute promoting respectively. Thus, we can acquire new knowledge, or gain a new view of old knowledge, as a result of understanding a similarity statement.

We are now in a position to elaborate on the three main claims. The first claim amounts to a definition of what might be called literal similarity. One important aspect of it is that it is the first step in blocking the "everything is like everything else" dictum. If the dictum is going to be true, then, if nothing else, it will not apply to literal similarity. Everything may be similar to everything else, but not literally similar in the sense just defined. Furthermore, I maintain that this account of literal similarity is in accordance with the way in which ordinary people think of the relation normally expressed by the word similarity. The literalness of a similarity statement is not to be conceived of as an all or nothing affair. The boundary between the literal and the metaphorical is notoriously too murky for that. Rather, literalness is to be thought of as being at one end of a continuum. Nor should literalness be confused with the degree of similarity; the two are related, but are different measures.

The second claim is essentially our proposed definition of metaphoricity. The main point is that insofar as attribute matches can be found between the schemata corresponding to the terms, these matches are (initially) of higher salience for the second term (the metaphorical vehicle) than for the first (the topic), or they are themselves

metaphorical. To take a simple example, being soporific is a much more important attribute of sleeping pills than it is of lectures, so that Lectures are like sleeping pills satisfies this requirement. The alternative case is perhaps illustrated by a statement like Libraries are like gold mines where the shared attributes seem to include notions of digging around and being valuable, but where these notions themselves seem to undergo a metaphorical transformation from the one term to the other. It is as though the main metaphorical comparison gets its force from the little ones that comprise it. Ultimately, of course, the account has to come to rest on the salience imbalance notion, for otherwise it would be circular.

There are other constraints that have to be considered. First, a similarity statement satisfying this "high/low" criterion will not be perceived as metaphorical unless there exist important attributes of the second term which cannot be applied to the first term at all. This constraint is needed to prevent literal similarity statements of the attribute promotion type from being classified as metaphorical. If somebody does not know what tangelos are, and is told that they are like oranges, the high/low criterion would be satisfied, but the present constraint would prevent its being classified as a metaphorical comparison. Notice also that it is this constraint that introduces into metaphorical comparisons the element of tension that so many writers have considered to be an essential ingredient of metaphorical language. This is because it entails some degree of conceptual incompatibility between the two terms.

The second constraint on the high/low rule is that the attributes that are found to match must not be initially too unimportant or trivial for the topic term. Another way of putting this is to say that promoted (or introduced) attributes must, in principle, be able to serve some diagnostic function. So, for example, if we hear that Cigarettes are like time bombs, we need to avoid concluding that part of the statement's meaning depends on the fact that both are used by terrorists, because such a conclusion would be entirely counterintuitive. Since cigarettes are used by all kinds of people, emphasizing the fact that they can be used by terrorists does not increase the diagnosticity of the attribute "used by terrorists" for cigarettes. This amounts to saying that the candidate attributes must depend on both terms in the comparison, not just on the second term, and represents one way in which the present proposals can make sense of the notion of interaction.[1]

Finally, it often happens that one cannot understand a metaphorical comparison in terms of matching individual attributes at all. Rather, what one senses is a certain isomorphism between systems of attributes. Such cases, for example, Schools are like zoos, have more the character of complex analogies, although still being essentially metaphorical. Their metaphoricity now depends less on the difference in importance of these systems for each of the schemata involved, and more on the fact that the relationship between the matching systems is itself based largely on metaphorical rather than on literal similarity.

The third major claim of the theory is that statements which have the syntactic structure of comparisons but which are not perceived as being either literal or metaphorical are in fact perceived as being anomalous. Such statements are of two kinds: those in which such matches as do exist are between attributes that are unimportant for both terms, and those for which the matches are between attributes that are important for the first term, but unimportant for the second term (i.e., reversed similes). This means that the present theory makes some very specific predictions about the reversibility of different kinds of similarity statements--predictions that Richard Vondruska and I are at present investigating in a series of experiments.

It is important to emphasize at this juncture that nothing I have said rules out the possibility of someone's being able to find a metaphorical interpretation for an anomalous comparison. But, if someone succeeds in finding such an interpretation, then that statement will no longer be perceived as being anomalous. Similarly, if one fails to understand a metaphorical comparison at all, it will be perceived as anomalous, regardless of its metaphorical potential. Since the knowledge that people have associated with the terms in a similarity statement depends on their own experiences, it is perfectly possible that there will be cases of disagreement. This is particularly noticeable when people with little or no literary training come across metaphors that require such training, that is, metaphors whose interpretation depends in important ways on what, for example, Culler (1975) refers to as the "institution of literature." And,

finally, it is also perfectly possible that there should be occasions upon which someone produces a statement that is from his or her perspective metaphorical, but which from someone else's perspective is literal.

The theory, then, is a theory about the conditions under which someone will perceive a similarity statement as being metaphorical, literal, or anomalous. It is a theory that allows the possibility that one man's metaphor is another man's platitude. In order to translate it into a theory of metaphor proper, we need to do two more things. The first is to note that statements of analogy can vary in the extent to which they are literal or metaphorical just as simple similarity statements can. After all, a statement of analogy is nothing more than a statement of similarity between relations rather than between things. Some of these relations are shared and some not. The criteria for whether a statement of analogy will be perceived as metaphorical, literal, or anomalous are the same as for similarity statements in general, except that the attributes are (known or constructible) relations between the two pairs of terms.

The second issue that needs resolution concerns the move from similarity statements to metaphors. Metaphors come in all manner of syntactic guises. The favorite one for philosophers is the predicative metaphor. The favorite one for the poet is probably the genitive metaphor. The predicative metaphor bears a very close and obvious connection to the metaphorical similarity statements that I have been discussing, the only syntactic difference being the fact that the similarity statement version, the simile, includes the word <u>like</u> whereas the predicative metaphor does

not. It would be easy to argue that there is no semantic difference between a simile and its corresponding predicative metaphor, but such a conclusion is not one that is either entailed by my account of similarity, nor is it one that I would encourage. The claim that I want to make is that both the simile and its corresponding metaphor are metaphorical, the former, by definition, and the latter by virtue of the fact that a large part of its meaning can be given by reference to the simile. I certainly would not wish to deny that subtle, but nevertheless important, differences exist between the two forms.

A detailed discussion of what dictates a person's choice in selecting the one over the other in a particular context is beyond the scope of this paper, but it is an important question that needs to be considered. I am inclined to believe that the process often involves the same kind of pragmatic factors that lead people to choose between direct and indirect speech acts in particular situations--that is, they are mainly considerations of style. However, there clearly are various syntactic considerations that make the transformations between simile form and metaphor form either difficult or impossible. For example, as Miller (1979) points out, The crowd rushed through the door like a river bursting through a dam cannot be transformed from simile form into metaphor form by simple like-deletion. One might speculate that when syntactic constraints are not at issue, the ease of transforming a simile into a metaphor depends on the extent to which the comparison is metaphorical. Thus, while Jogging is like a religion and Running is like a religion are both similes, many people feel

that the former is somehow "better." It also seems more amenable to transformation. If the account of similarity that I have proposed is correct, then similarity statements having some degree of metaphoricity can also have some degree of literalness. The metaphor form of a simile, however, tends to eliminate the literal component so that, to the extent that the literal component is contributing to the meaning, it will be blocked in the metaphorical form. One cannot, after all, perform like-deletion on literal similarity statements at all.

The general issue of the relationship between metaphors and different syntactic constructions is a complex one. Genitive metaphors, for instance, seem to be richer in potential than predicative metaphors, perhaps because they leave so much more unsaid than do predicative metaphors. Thus, to take a simple example, suppose we are faced with the phrase life's dawn. What we actually have underlying this metaphor is a four term analogy, x:life :: dawn:y. This particular example is rather trivial because y is so unlikely to be anything else but day, whereupon we see that the putative similarity is that between some relationship(s) between x and life, and dawn and day. The relationship is thus something to do with the onset or signalling of life. However, in general one can expect much more complicated structures to play a role in genitive metaphors so that the solution to them may well depend on various other elements of the text as well as on extratextual factors. In such cases, understanding a metaphor may become something more like a problem-solving exercise. The point, however, is that beneath it all, it is possible to discern the role played by similarity. To understand

the metaphor ultimately involves discovering or creating relationships that give rise to a coherent similarity statement, even though that statement may be of no interest in itself. An interesting recent analysis of the relationship between various surface forms of metaphorical statements and their underlying structures can be found in Miller (1979).

What we have, then, as a theory of metaphor, is the claim that metaphors are always, in principle, reducible (although not necessarily semantically or communicatively equivalent) to statements of similarity. However, the similarity statements to which they can be reduced are themselves metaphorical (being either similes or metaphorical analogies). In effect, I have tried to give a precise meaning to Goodman's (1976) insightful remark that ". . . instead of metaphor reducing to simile, simile reduces to metaphor" (p. 77).

Psychological Processes in Metaphor Comprehension

So far I have offered an account of metaphors that purports to explain what the essence of metaphoricity is. The theory, which I have classified as a modified comparison theory, has a number of implications for the nature of the psychological processes involved in the comprehension and production of metaphors. In this section I shall review some of these implications.

A general consequence of the view that I am espousing is that similarity statements, be they predominantly literal or predominantly metaphorical, can all be handled by a uniform comprehension process. The differences between literal, metaphorical, and anomalous statements will lie not in different processing mechanisms, but in the properties of the basis

of similarity that the processing mechanism uncovers. Suppose that comprehension involves attempted predication of the more salient attributes of the second term to the first term. If none of the important attributes of the second term can be applied successfully to the first term, the comparison statement will be perceived as being anomalous.[2] If some can, the statement will be understood as being literal or metaphorical to the extent that those attributes that are applied are perceived as being of comparable or less importance, respectively, for the first term.[3] Notice that one test of the applicability of an attribute is to determine whether that attribute is already present (i.e., to determine if there is a match). The most important point of this account, however, is that it does not necessitate the postulation of any special kind of process for the comprehension of metaphorical as opposed to literal similarity statements. This is an attractive feature for those impressed by cognitive and descriptive economy. Furthermore, it suggests that the same process could be at work in the comprehension of, at least, predicative metaphors. Statements of subject-predicate form could also be viewed as being understood in terms of attempted predication. The distinction between literal, metaphorical, and anomalous statements would be captured in the same way as for similarity statements. Whether metaphors manifested in other structures (e.g., genitive metaphors) are amenable to the same kind of economical account of processing is less obvious, although Ortony, Schallert, Reynolds, and Antos (1978) found evidence for at least one other type of metaphor that is. They describe an experiment in which entire

sentences were interpreted following contexts that either induced a literal or a metaphorical interpretation of them. They found that, given sufficient contextual support, metaphorical interpretations were not significantly slower to make than were literal ones.

The possibility that metaphorical uses of language can be understood without employing any special or additional comprehension mechanisms is difficult for some theoreticians to accept (e.g., Miller, 1979; Searle, 1979). This is because it is assumed that metaphors are usually literally false or nonsensical. So, a person faced with a metaphor is presumed to attempt a literal interpretation, and then to discover that such an interpretation fails to fit the context. At this point a reinterpretation process is postulated--often one which converts the metaphor into an underlying, literally true (sic), simile. The problem with this account is that it begs the question. On what basis is one supposed to know that on encountering, for example, a literally false sentence, a metaphorical interpretation is called for? How, for example, is one to know that one should probably interpret John's grandmother is a vegetable metaphorically, but not A tomato is a vegetable? It looks very much as though one must already have understood the sentence in order to know how to interpret it. Certainly, being literally false is neither a necessary nor a sufficient condition for a statement to be a metaphor. To make a mistake is not to make a metaphor; and, although it is literally true that life is not a bowl of cherries, it would normally be odd to choose the literal over the metaphorical interpretation.

Now, while I have been arguing that metaphorical statements can be interpreted directly, without calling upon any extraordinary assumptions about how they are understood, I do not believe for one moment that all metaphorical uses of language are understood directly. I suspect that many of the more mundane metaphors that occur in everyday language probably are, but there is no doubt that many, especially but by no means exclusively, literary metaphors are not. Of course, failure to directly comprehend is not limited to metaphorical, or even figurative uses of language. Literal language can be difficult or impossible to understand too if, for example, it is insufficiently closely related to its surrounding context. Indeed, one of the things we know about normal language processing is that people are continually making spontaneous inferences from what they hear or read beyond what is given in the text. Often, if these inferences are not or cannot be made, comprehension is impossible. It seems reasonable to suppose that when one encounters an obscure expression that does in fact call for a figurative interpretation, arriving at an appropriate interpretation may require inferences to be made, including ones that involve an awareness of the conventions relating to figurative uses of language. If this is correct, it has important implications for the way in which we conceptualize the development of the ability to understand and produce metaphors, as well as the development of children's artistic awareness more generally.

Gardner (in press) characterizes the period between the ages of 7 and 9 as being "the heights of literalism." It is, he explains, a period during which the child is much involved in learning rules and conventions. If the

comprehension of metaphors sometimes presupposes knowledge of metalinguistic rules and conventions, then one would expect to find children experiencing difficulty with metaphorical language until about age 10. Indeed, much of the developmental research pertaining to the comprehension of metaphors by preadolescent children tends to promote just this conclusion (e.g., Asch & Nerlove, 1960; Billow, 1975; Cometa & Eson, 1978; Elkind, 1969; Winner, Rosenstiel, & Gardner, 1976).

However, the situation is not as straightforward as this. The problem is that even preschool children seem to spontaneously produce metaphors, as every parent knows. Furthermore, preschoolers have been shown to be able to perform well on numerous metaphor-like comprehension measures (e.g., Gardner, 1974; Gentner, 1977; Malgady, 1977). How can it be that children produce metaphors at such early ages while apparently not being able to properly understand them until much later on?

The resolution of this paradox requires that we take a much more careful look at the various claims that are being made, and the evidence that is offered in support of them. If the account of the comprehension of metaphors that I have proposed is correct, then we might expect to find conflicting evidence about children's abilities to understand metaphors depending, at least, upon whether the metaphors they were called upon to understand were intelligible to them directly or not. If it is true that not all metaphorical uses of language require the awareness of conventions that Gardner sees as the sine qua non of comprehension, then it ought to be possible to find children showing evidence of comprehension even during

their "height of literalism." Furthermore, to talk of conventions too generally may be inadvisable. Presumably, understanding the convention of metaphor as a rhetorical device requires a great deal more sophistication than does knowledge of the conventions surrounding, for example, the use of indirect speech acts. According to the the view of metaphor that I have proposed, many metaphors can be viewed as indirect statements of similes. Ralph Reynolds and I have collected data showing that 7- and 8-year-olds have no problem understanding the similes that correspond to metaphors that they apparently cannot understand (Reynolds & Ortony, Note 1). So perhaps the problems associated with children's understanding of metaphors are not due to general cognitive constraints on understanding metaphors per se, but are specific problems that cause difficulties just in those cases that depend on an awareness of figuration as a rhetorical device. However, this does not mean that all the experiments suggesting that children cannot understand metaphors until close to adolescence are based on cases of metaphors that in fact require an awareness of the conventions surrounding figuration. Rather, one has to realize that many of these studies are based on tasks that are themselves more demanding than the comprehension of the metaphors they are designed to measure. In particular, they are often based on the child's ability to <u>explain</u> the meaning of the metaphor, something whose difficulty is probably highly correlated with the aptness and appropriateness of using the metaphor in the first place. Thus, if a metaphor is used because it is the best, perhaps the only way of saying something, it may be correspondingly more difficult to explicate its

meaning. Further, there is abundant evidence that children's ability to explain or talk about what they are doing lags behind their ability to do it.

From all of this, I am inclined to conclude that the evidence allegedly supporting the late development of the ability to understand metaphors is not very compelling (see Ortony, Reynolds, & Arter, 1978, for a more comprehensive review). I think that much of the research on which this view is based tends to underestimate what children are able to do. On the other hand, I am not very optimistic about the interpretations that are placed upon the apparently ubiquitous production of metaphors by preschoolers. There, I think we have an overestimate of children's capacities.

Two kinds of claims are usually made in support of the belief that children can handle metaphors even in their preschool years. First are claims based on experimental evidence that children seem to perform well on a number of metaphor-like tasks, and second are those based on the observation that very young children seem to produce metaphors with gay abandon. I think that both sources of evidence need to be treated with some caution. The experimental evidence is based on tasks whose relationships to metaphor comprehension are uncertain. Thus, the fact that young children can solve simple analogical reasoning problems (Gentner, 1977), or that they can appropriately relate polar adjectives like <u>hot</u> and <u>cold</u> to stimuli from different sensory domains such as red and blue colors (Gardner, 1974), does not itself constitute evidence of ability to understand metaphors. According to some notions of metaphor, such as the Aristotelian view that

they are based on the principles of analogy, findings like these could be counted as strongly suggestive; but, according to others, they could be irrelevant.

One of the points that Gardner (in press) makes about the child's development in the early years is that children tend to focus on the more salient and concrete components of situations. I think that this feature provides a way of understanding, in terms of my own account of metaphor, what the preschooler who apparently is producing metaphors might actually be doing. If we make the (reasonable) assumption that the young child has less rich internal representations of objects than does the adult, and if we assume that such representations are less highly differentiated in terms of the relative salience of their constituents, then we would expect the child's perception of similarities to be somewhat different from those of adults. In particular, the child may perceive literal similarity where the adult perceives metaphorical similarity, because for the child the matching attributes are represented as being important for both terms, whereas for the adult the matching attributes appear to satisfy the criterion for metaphorical similarity. In other words, from the child's perspective, many of the utterances that he makes in an effort to communicate with his limited vocabulary might be utterances that capitalize on his perception of high (literal) similarity. Those same utterances from the adult's perspective could appear to be either literal, or metaphorical, or even unintelligible. If one accepts this account, one need not attribute to the child the ability to produce metaphors. One need only attribute to the child the ability to

perceive similarity--a much less radical claim. As the child acquires more knowledge, so the nature of the similarities that he perceives will change. Eventually, metaphorical productions not requiring a conscious knowledge of the metalinguistic aspects of figuration will begin to emerge as the child's knowledge representations acquire a sufficient level of richness and diversification. Later still, the conscious use and manipulation of metalinguistic conventions will permit the knowing production of metaphorical language.

It would be exceedingly difficult (although not, I think, impossible) to collect systematic experimental evidence in favor of this kind of account. However, some of the productions of young children can be interpreted in a manner that is at least consistent with it. First, let us consider a seemingly convincing case of metaphor production by a very young child reported in Carlson and Anisfeld (1969): "At 29 months he climbed over his wrestling father and brother and slid down the other side, saying, 'I'm a big waterfall'" (p. 570). If we consider the two terms in an underlying comparison to be a (big) waterfall and the child's motion, then we are left only with the decision as to whether from the child's perspective he (or his movement, action, or whatever) was really like a big waterfall, or only metaphorically like one. The question is, how much knowledge about waterfalls and his motion can we attribute to the child? Presumably he knows much less about waterfalls that we do. Perhaps he knows that they involve rapid downward motion (of water?), and that they are pleasant to look at. If the most important things about his own motion is

that it involves rapid downward motion and is pleasant, then it would be essentially a literal comparison. Notice too that if he had said he was falling he would perhaps have conveyed an unpleasant experience, which might have totally misrepresented his intentions. Who knows! The point is that it is no more unreasonable, given our expectations about his relatively superficial knowledge about the things to be compared, to suppose that he perceived them as being really similar.

By age 4 or 5, children are beginning to acquire richer, although still not adult-like, representations; so now we might expect to see different patterns emerging. To illustrate this, we can refer to a couple of Chukovsky's (1968) more irresistible examples of the 4- and 5-year-old's excessive literalism: First, in "I like garlic, it smells like sausage" (p. 21), it looks very much as though the child's explanation for liking garlic reflects his or her still inchoate schemata for both sausage and garlic. The two smell alike because both share some third thing which imparts to them their characteristic smell. That third thing, whatever it is, is equally important for both. What is important here is the fact that the terms in the (literal) similarity statement, Sausage smells like garlic, are, from the adult perspective, inappropriately reversed. Presumably such a reversal would be much less likely if the utterance were based on a full understanding of the various relationships that exist between sausage, garlic, the smell, and so on. Indeed, what we find amusing about such utterances is precisely the discrepancy between what we believe to be true and the way the world would be if it fitted the child's statement.

The second example supports the idea that the child focusses on the more salient concrete attributes, perhaps not even possessing those attributes required to properly understand the comparison:

> "Betty, why didn't you provide a knife and fork for Mr. White?"
>
> "Because I thought he didn't need them--daddy said he ate like a horse" (p. 13).

Here the child seems to interpret the similarity statement Mr. White eats like a horse as a literal comparison by failing to block the transfer of inapplicable predicates. This illustrates the importance of the condition on metaphoricity that there be some high salient attributes that cannot be applied. Could it be that Betty lacked sufficient knowledge to know that one of the most salient characteristics of the way horses eat is not applicable to people?

Conclusion

I have proposed an account of the perception of similarity that has metaphoricity as a dimension; consequently, I am committed to the view that at some level, all metaphors can be reduced to metaphorical similarity statements. I do not doubt that this account leaves at least as many important questions unanswered as it answers; in this respect it is in good company! One of the most important issues that I have not come to grips with is the nature of the mechanism for deciding whether some attribute or set of them can be applied to something. Nor do I think that I have given a sufficiently general account of the relationship between the various forms in which metaphors are manifested and the more constrained form of the

similarity statement: nor yet with the variables that govern the "goodness" of similes and metaphors--why is it that some similes "feel" better than their corresponding metaphors while others "feel" worse? I think that these are all tractable problems, but rather than speculating about directions for their solutions, I want to conclude my discussion by taking a brief look at the nature of metaphors in various types of discourse, and to use that as a route back to one of the topics that I set out at the beginning of this essay, namely, that of insight and creativity.

Without wishing to get embroiled in a discussion of what constitutes each, I want to distinguish between three broad categories of discourse types. The boundaries between them may not always be clear, but I have in mind the rather intuitive notions that might correspond to discourses that we could label as literary, everyday, and scientific/technical. And, although I shall talk as though the metaphors to be found in such discourses are a feature of the discourses themselves, I think it important from the start to make clear that the linguistic manifestations of metaphors have to be regarded as the manifestations of thought. That is, a metaphor is not just a linguistic entity, it is a more general cognitive entity which, for example, could be entertained in thought but which might not, and need not, be realized in language. Since metaphors have to do with perceptions of similarity, and since we do not report all our perceptions, metaphors are not necessarily restricted to language.

Before discussing each type of discourse in turn, a general observation needs to be made, and that is that metaphors do occur in all three kinds of

discourse. Their typical nature and functions may be different in each, but they are there nonetheless. The fact that metaphors occur in literary discourses is, of course, no surprise. For a long time the analysis of the figurative expressions in literature, and especially poetry, constituted the principal goal of criticism. The occurrence of metaphor in everyday discourse is also not difficult to accept, although one might suppose that many of the metaphors to be found there would be of the kind that normally are understood directly--often half frozen, and rarely profound. However, that metaphors might be widespread in scientific/technical discourse may, at least for some, be harder to believe.

If literary discourse has any special claim to metaphors, as historically it has, and if in fact metaphors are ubiquitous in other kinds of discourse, on what basis could the privileged status of metaphor in literature rest? One possibility is that literary discourses contain a high proportion of non-directly interpretable metaphors. The "problem-solving" element involved in understanding literary metaphors has not gone unnoticed. Culler (1975), for example, writes:

> Though structuralists have not made this point as firmly as they might, their discussions imply that rhetorical figures are instructions about how to naturalize the text [i.e., making the text intelligible by relating it to various models of coherence] by passing from one meaning to another--from the deviant to the "integrated"--and by labelling this transformation as appropriate to a particular poetic mode. . . . The rhetorical figure, says Genette, "is nothing other than an awareness of

> the figure, and its existence depends wholly on the reader being conscious, or not being conscious, of the ambiguity of the discourse before him" (1966, p. 216). One has a rhetorical figure when the reader perceives a problem in the text and takes certain rule-governed steps to devise a solution. (pp. 179-180)

Since "naturalization" requires, among other things, that the text be related to the "institution of literature" by reference to what is known about such features as the conventions of the genre, and the conventions of the (author's) culture, it is not always easy for the uninitiated (including children) to understand and appreciate a wide range of literary works. The child cannot acquire real literary awareness merely by becoming an adult; all too many adults have proved that! Thus, while concurring with Gardner's emphasis on the need for knowledge of conventions for the development of artistic awareness, we must be careful to realize that such conventions can be very broad in scope. They include not just conventions of the medium (say, language) but a much higher level of knowledge about what is, was, and even what could be conventional, institutionalized, or accepted. This is not to deny that one can come to master only those conventions needed to appreciate a particular genre. We all know that most children quickly come to appreciate children's stories. But such appreciation should not be confused with the kind of "literary awareness" that enables one to read, understand, interpret, and evaluate literary works in general. The litterateur typically is equipped with the cognitive tools needed to engage in such activities; the layman, typically, is not. Finally, this difference

suggests that we need to conceive of the directness of the comprehension of metaphorical language as involving a degree of relativism. Just as with literal uses of language, the expert may not always need to consciously search for inferential connections to establish the coherence of a discourse. On the other hand, the novice is both more likely to have to consciously search for them, and less likely to find appropriate ones, if he finds any at all. So, the expert's highly specialized and differentiated knowledge may sometimes enable him to understand directly what the novice cannot understand at all.

That metaphors are widespread in everyday discourse is something that can be readily confirmed by glancing at any newspaper or listening to any ordinary conversation. We are constantly running across (sic) economic depressions, political battles, and technological miracles. We speak of lights at the end of tunnels, glimmers of hope, and shadows of doubt, cars and noses that run, and trains and colds that get caught, and people who choose to take soft options and hard lines. We talk of the heat of the moment, the warmth of a reception, the coolness of a calculated crime, and, yes, the frozeness of a (dead) metaphor! The list is endless.

Ordinarily we do not stop to think twice about the multitude of dead metaphors that we encounter in the living language; they seem as prosaic as fish and chips or hamburgers. And even those metaphors that are a little more novel, the half-dead, or dying ones, such as references to political seismographs or barometers, do not strike us as exceptional, and they do not seem to require any special comprehension processes. Generally, the

metaphors that are abundant in everyday discourse are understood directly. If everyday discourse has deep and profound metaphors, they are surely outnumbered by the cliches which have been absorbed into the language and for all the world look and behave like literal expressions. If this is so, perhaps it is all to the good; everyday discourse cannot afford the luxury of poetic obscurity. It has its own communicative ends and is appropriately tailored with its own communicative means.

But what of scientific/technical language? Is that not characterized, necessarily, by clarity and precision? Can the scientist afford the ambiguity and open-endedness of metaphors in his attempt to describe and explain "reality"? Positivists would certainly have denied the scientist that possibility. Recent trends in the philosophy of science have been more generous. It is coming to be recognized that new scientific conceptions, discoveries, and insights do not necessarily come with ready-made literal language to express them. The scientist may have to stretch and extend the existing language in order to talk about them. Boyd (1979) has argued that in many cases scientists need metaphors in a quite fundamental way. Sometimes, he argues, they have to use metaphors

> . . . in which metaphorical expressions constitute, at least for a time, an irreplaceable part of the linguistic machinery of a scientific theory: [these are] cases in which there are metaphors which scientists use in expressing theoretical claims for which no adequate literal paraphrase is known. Such metaphors are <u>constitutive</u> of the theories they express, rather than merely exegetical. . . . If one

> looks at theory construction in the relatively young sciences like cognitive psychology, one finds theory-constitutive metaphors in abundance. (p. 360)

Boyd has in mind examples such as the claim that thought is a kind of "information processing," and that the brain is a sort of "computer."

The transmission of novel scientific conceptions, then, sometimes is achieved through the use of metaphors, and, one might add, since in the teaching of science (and anything else for that matter) the subject matter is usually novel from the perspective of the student, one would expect to find metaphors fulfilling an important pedagogical function. Examples are familiar enough--the structure of the atom is like the structure of the solar system, electrical flow is like water flow, and so on. In terms of the account of metaphor proposed in the first part of this paper, it should be said that most of the more useful metaphors in scientific language tend to involve metaphorical similarity between two systems of concepts, rather than between two concepts alone. For this reason, they should perhaps be regarded as metaphorical analogies, or better still, metaphorical models; the distinction between an analogy and a model would be based on the number of terms--an analogy being a similarity between two pairs of terms and a model being a similarity between two n-tuples of terms ($n > 2$). These more complex realizations of metaphorical similarity are not likely to be directly understood, although, of course, once familiar, they presumably come to possess all the characteristics of the dead metaphors so predominant in everyday discourse.

If Boyd is right that some metaphors actually constitute the theories in whose explications they participate, it would be reasonable to suppose that those same metaphors played a crucial role in the thought processes that took place in framing the theories in the first place. In other words, the metaphors might be playing a role in the creative process itself. Metaphors, by juxtaposing incompatible elements, can portray order in chaos. They are sense buried in non-sense (sic), meaning in anomaly. Creativity and insight are terms we apply in just those cases where the confusion of a problem is dispersed by means of a nonlogical, often unobvious, solution. To produce a fruitful metaphor is to be creative in a microcosm. To produce a fruitful system of metaphors, be it in science or poetry, is to be creative on a larger scale. In spotlighting nonobvious similarities in the face of obvious dissimilarities, metaphors afford views of what previously may have been invisible. It was to this vision that Aristotle referred when he said that a command of metaphor was a mark of genius.

Reference Note

1. Reynolds, R. E., & Ortony, A. Limitations on children's comprehension of metaphorical language: Competence or performance? Unpublished manuscript, University of Illinois, 1979.

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Footnotes

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[1]Another interesting way in which the notion of interaction might be encompassed in this account is if the first term is viewed as a context-setting concept for the second term. This approach would have to be explicated in terms of the influence that the first term might have in rearranging some of the salience levels of attributes of the second term. Since the second term as it were "reciprocates" by promoting the salience of matching or matchable attributes in the first term, the two terms would be interacting in the process of giving rise to an interpretation.

[2]It will, presumably, also be judged to be false. The question of how people make truth judgments about similarity statements is itself a complicated one. It may well be that such judgments are made on the basis of some internal criterion of "sufficient similarity." If two things are perceived as being insufficiently similar, regardless of the type of similarity statement, then the assertion of similarity between them will be judged to be false.

[3]In fact, this is an oversimplification, since it was noted earlier that other considerations enter into the perception of metaphoricity (e.g., that there be highly important attributes of the second term that cannot be applied to the first term at all).

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